Propulsive Descent Technology (PDT) Original Content

Completed Technology Project (2014 - 2016)

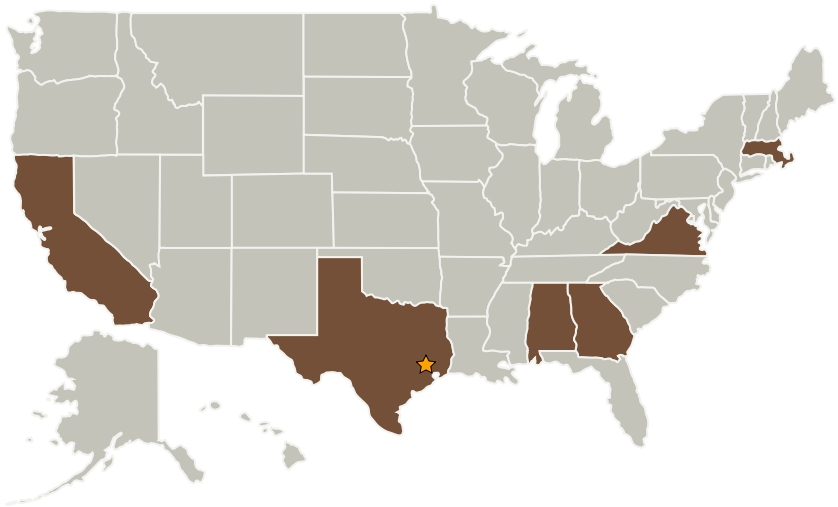
Project Introduction

Current technology does not support Mars human missions due to limitations in capability to land high mass support hardware. If we want to send people to Mars, we need to provide a new propulsive descent capability that extends to supersonic speeds and is applicable to human missions.

Anticipated Benefits

NASA Funded: No currently funded NASA missions are utilizing SuperSonic propulsive deceleration technologies derived from PDT investments. Potential NASA Mars Human precursor missions in the mid-2020 timeframe, or commercial application of these technologies in the next decade, represent the earlist potential infusion opportunities. NASA Unfunded: Future high mass robotic and human missions at or above ~3mt will require this technology. Propulsive-based SuperSonic deceleration capabilities are the only known technology that can close this gap. OGA: No applications have been identified for utilization by OGAs. Commercial: Advancement of SRP for terrestrial launch veh. return and reusability would be of benefit to the comml ind. Specific opps. May include Blue Origins, and Space x. Nation: The application of these technologies would advance NASA's ability to land humans on the surface of Mars in the 2030's.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Game Changing Development

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Alabama	California
Georgia	Massachusetts
Texas	Virginia

Project Transitions

February 2014: Project Start

September 2016: Closed out

Closeout Summary: The PDT project focused on supersonic retro-propulsion d escent technologies supporting a government-commercial partnership between NASA and Space Exploration Technologies Corporation (Spacex). In this partner ship, the focus was on establishing the capabilities and design knowledge need f or applying retro-propulsion to land large mass payloads on the surface of Mars. Flight data from Spacex Earth missions were used to advance engineering analy sis and design tools. The project also performed mission feasibility assessments for a Spacex Mars mission using the Dragon capsule.

Project Website:

https://www.nasa.gov/directorates/spacetech/home/index.html

Project Management

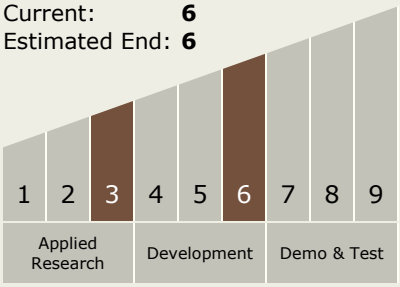
Program Director:
Mary J Werkheiser

Program Manager:
Gary F Meyering

Principal Investigator:
Charles H Campbell

Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



Target Destination

Mars